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FROM SYMBOLS TO WRITTEN LANDSCAPES THE ROLE OF ASTRONOMY IN ANCIENT EGYPTIAN ARCHITECTURE

1. Introduction

The civilization of ancient Egypt presents exceptional characters of cultural continuity in the course of almost three millennia. In particular, already in the period of the first dynasties (around 2800 BC) we have clear indications that the Egyptian ruler, the Pharaoh, was endowed with an aura of divine essence, and identified with a living god, Horus. The mechanism of power in Egypt was therefore based on the pivotal action of the ruler as intermediary with the Gods. Consequently, a fundamental duty that the Pharaohs assigned to themselves was that of keepers of the 'cosmic order': Maat, a key concept in Egyptian mentality.

Maat regulated the world – in particular, the natural cycles and hence the sun and the calendar – and was identified with a Goddess, daughter of the sun God Ra. The connection of Maat with calendrics and with the flow of time had the consequence that the doctrine of power in Egypt – and, in particular, the mechanism aimed to assure the afterlife of the deceased Pharaohs – was deeply intertwined with the celestial cycles. Witness of this connection are, in particular, the so-called Pyramid Texts, written in the burial chambers of the pyramids from the end of the 5th dynasty but certainly existing much before. These texts show the co-presence of a 'stellar' destiny in the afterlife of the Pharaoh, together with a growing importance of the cult of the sun and of the association of the ruler with the sun god (Quirke 2001).


It is possible to identify the time when the Pharaohs adopted their solar identification as the true basis of kingship: it is the reign of Khufu (2551-2528 BCE), the builder of the great pyramid of Giza. This conclusion can be drawn from a series of hints gleaned from architecture, which indicate that Khufu in some way declared himself to be the Sun God. His sons and grandsons would

consequently start to define themselves ‘Son of Ra’ and to acquire explicitly the Ra- particle in their names: Djedef-ra, Khaf-ra and so on. Interestingly, it was with Khufu’s father Snefru that the idea of materializing a symbol of divine power through a giant architectural project was first conceived, and it was with Khufu that this idea was implemented using a complex and spectacular combination of astronomy, architecture, and landscape. In what follows we shall describe this idea and the way in which it was actualized.

2. The symbolic Horizon

The Giza plateau, on the Western outskirts of modern Cairo, is perhaps the most famous archaeological site on earth. It is here that (around 2550 BC) Khufu, and later Khafra and Menkaura, choose to build their pyramidal complex. Describing Khufu’s tomb in details would be out of the scope of the present paper (see e.g. Lehner 1999). Here we shall only recall that each of the three pyramid complexes comprised also two temples, one near the pyramid and another downhill, connected by a monumental causeway. The most spectacular of such ensembles of monuments is certainly that of the second pyramid. The downhill (or ‘valley’) complex of this pyramid comprises two huge temples and the Sphinx, and is the elected place in Giza where to observe a spectacular image, once a year (Fig. 1). This image is formed by the sun setting at the summer solstice between the two main pyramids (Lehner 1999, Belmonte and Shaltout 2009, Magli 2008).



1. Giza, summer solstice. The sun sets between the two main pyramids recreating the hieroglyph *Akhet* .

The deliberateness of this phenomenon is out of question. In fact, the image formed by the sun and the two pyramids is a giant replica of a hieroglyph, a sort of Gargantuan drawings which needs a star and two enormous monuments to be written. This hieroglyph is *Akhet* ☐. Akhet represents a symbolic horizon, where the sun sets between two paired mountains. The image of the two mountains was in itself a symbolic hieroglyph called *djew* ☐, and was linked to the death cult since early dynastic times in Abydos – to the extent that Anubis, guardian of the underworld, was sometimes called ‘he who is between two mountains’. Khufu’s father Snefru had already made a spectacular reference to this symbol in his tomb complex at Dashur. Here indeed, two giant pyramids (so-called Red and Bent pyramid) combine to form, when viewed from Saqqara, precisely the ‘sign of two mountains’ ☐ (Fig. 2).



2. Saqqara south. The view towards Dashur in a clear day. The two pyramids of Snefru form the hieroglyph *djew* ☐.

With the addition of the setting sun, the region called Akhet became in Egyptian’s mind a place of rebirth and transformation for

the spirit of the deceased, the place where the dead prepare themselves for the afterworld, and making its image explicit was a way of symbolizing afterlife. This powerful image was, at Giza, completed by the Sphinx, which was called Hor-em-Akhet that is 'Horus in the horizon', Horus being the God whose incarnation on earth was identified with the Pharaoh. Last but not least, this idea of 'writing the word horizon at the true horizon' had a counterpart in the actual, written language. Indeed, each pyramid of ancient Egypt received a name, and the name of the Khufu pyramid was precisely 'the Akhet of Khufu'.

We see therefore that a complex interplay was in action between ideas, writings and artistic creations. The same concept, once introduced, remained in Egyptian religion and religious architecture for millennia. A glaring example comes from the reign of Amenhotep IV, some 1200 years later than Khufu.

This king changed his name from year five of his reign to Akhenaten, and is universally known for his religious revolution, a monotheism centred on the Aten, the Sun Disk (Redford 1987). The revolution took place in rapid stages and was reflected in the progressive dismantling of the existing religion. This implied the closure of temples devoted to other gods, including Karnak, with the chief priest of Amun dispatched on a mission to a remote quarry. Veneration for the Aten was already existing in Egypt, but in Akhenaten's conception the Sun disk was elected as universal and exclusive god: the only high priests of the Aten were the king and his wife Nefertiti. The works of art of the period make it clear that it was precisely the disk, depicted with rays terminating in helpful little hands, that was the object of Akhenaten's worship. It is therefore obvious to expect a special role for sunlight in the king's architecture of the period and, indeed, this role is especially clear in the newly founded capital of the reign, located at Amarna in Middle Egypt.

Amarna is a sort of desolate bay of flat land, stretching for some ten kilometres along the East bank of the Nile and surrounded by desert cliffs. It is located at about 300 km to the north of Thebes, roughly mid-way to Memphis. The city was ritually founded, so that the landscape at Amarna is an example of consecrated landscape (it was perhaps chosen due to the occurrence of a solar eclipse; see Magli 2013 for details). The ritual limitation of the sacred space assumed here the form of the so-called boundary stelae; niches carved in the rock banks, containing statues of the

royal family and official inscriptions which passed on various information. For instance, the dimensions of the town and the name of the most important buildings and temples are given; further, the stelae repeatedly mention the date of foundation as 13 Peret 4 (the 13th day of the fourth month of the Peret season, see Murnane and Van Siclen 1993).

The city planned by the Akhenaten architects was abandoned shortly after the death of the King, and rapidly divested of almost all its implements, so that today practically only the foundations and the lower courses of the buildings remain. However, it is the very fact of this abandonment that gives us a unique opportunity to understand the ideas about urban town planning, architecture, and symbolism which prevailed at that time. In particular, the temples were quite different in conception from those of the existing Egyptian religion, where spaces became increasingly cramped and dark the nearer one was allowed to approach the final chapel. The Amarna temples are essentially courtyards open to sunlight the whole day and filled with altars. The largest, today called the Great Aten Temple, occupied an area of 800 x 300 metres enclosed in mud bricks walls. The second main temple, also called the Small Aten Temple, stands nearby. This building has an explicit connection with the Pharaoh tomb, which is located on the same (East) bank of the Nile, in a narrow side valley of a Wadi (a dried river) that dominates the Eastern horizon of the town (Fig. 3).



3. Amarna. The axis of the temple towards the mouth of the royal wadi.

This choice is quite unusual for a Pharaoh tomb, since the divine rulers were always buried in pyramids or tombs located on the Western bank, due to the association of death and rebirth with the setting sun. The choice of the East bank is connected to the Akhenaten doctrine. Indeed, in the old religion the sun was doomed to a potentially dangerous travel each night, to enjoy re-birth at the following dawn. Nothing about this can be found in the Amarna texts: the Aten simply leaves the earth in the dark each night, and comes back the day after. So the King's tomb is located in the East since his re-birth is 'given for granted' as well as the sun's disk return. In other words, the location of the tomb alludes to the king united with the Sun, as it is standard in the Egyptian tradition, but the union is not celebrated at sunset – as in Giza – but at sunrise. It is this stage that was put in evidence through the materialization of a powerful symbol. Indeed, the axis of the small Aten temple points towards the 'mouth' of the royal Wadi. There can be hardly any doubt that this alignment is associated with afterlife, since here a beautiful hierophany was planned. Indeed, the sun, seen from the temple, rises in between the sides of the Wadi twice a year. In these two dates (February 23 and October 24 Gregorian) the sun framed by the sides of the Wadi creates an Akhet sign, which is still visible today (Gabolde 2005).

To understand the meaning of this 'message' we recall that

the Giza hierophany was intended to replicate the name of the Khufu complex – the Akhet of Khufu – at sunset during the summer solstice. In Amarna, a similar hierophany was created to replicate the name of the new city. In fact, the ancient name of the capital was Akhet-Aten, the Horizon of the Aten. It is not easy to anchor the date of foundation of the city mentioned in the stelae (which of course is given in the Egyptian calendar) to a precise Gregorian date, due to uncertainties both in the date of reign of the King and in establishing the starting year of the Egyptian calendar. However, there is hardly any doubt that the date of foundation fell around Gregorian late February in the years around 1350 BC, which individuates (roughly) the Amarna period. Therefore, perhaps Amarna preserves the first example of a tradition which linked the orientation of a town, and therefore the different lighting of the main roads in the course of the year, with a specific date relevant for its foundation. Interesting examples of this phenomenon are known from the classical world; for instance Alexandria has been shown to be orientated to the rising sun on the day of birth of Alexander the Great (Ferro and Magli 2012) and the project of the Pantheon in Rome has been shown to be linked to the mythical date of foundation of the town (Hannah and Magli 2011).




3. Symbols, writings, and architecture

Which is the origin of such a complex way of connecting architecture, astronomy, and symbolism? To address this problem, we must first of all put in evidence that there is nothing ‘esoteric’ in these messages: they were conceived and realized with the aim of being explicit references to the power of the living God, the Pharaoh, and to his ability and rights to the afterlife. But, why was a hieroglyph symbol chosen as the key to convey such messages? The answer must start from the ancient Egyptian analogy between writing and cosmos, a concept which has been formalized in the works by Assmann (2003, 2007).

Hieroglyph writing is documented in Egypt from about 3300 BC. From the very beginning, it developed as a mixed system. One component was phonetic, including alphabetic glyphs, another was logographic, representing morphemes; the texts however also contained determinatives, images which were not usually read but helped in specifying the meaning of words; glyphs could be used with ideographic meaning on occasion. There was a profound connection between writing and religion. This connection is re-

lated to cosmological beliefs, for the very act of creation in the Egyptian conception appears to be connected with writing in a structural analogy between language and cosmos. This analogy is based on a one-to-one relationship: the totality of creation is made of 'all things, all hieroglyphs'. A written sign was thus connected with a real thing in a manner somewhat similar to the relationship between thing and concept, later elaborated in Greek philosophy.

Observe now that hieroglyphs can be divided in groups according to what they represent: for instance, human activities, objects, flowers and plants, and so on. A vast group is the one connected with sacred architecture. It is therefore natural to investigate the role of the above-mentioned analogy in architectural context. Actually, what turns out is that Egyptian sacred architecture is replete with gigantic replicas of hieroglyphs in a complex and interactive way.

First of all, an architectural entity can be a physical realization of an idealized, but easily recognizable object: a pyramid clearly is a giant actualized replica of her own hieroglyph , and the same holds for an obelisk . Consider, however, the hieroglyph . It represents a stylized loaf of bread on a reed mat, meant as an offering scenario. Thus, we could manage to guess that the hieroglyph means 'altar', and, indeed, it is so. However, the physical reality, Egypt, on his own is plenty of *stone* altars which are giant replicas of the hieroglyph which *represents* an altar. The most spectacular is probably the giant, quadruple alabaster altar orientated to the cardinal points which occupies the court of the Sun Temple of Niuserra (5th dynasty) at Abu Gorab, but hundreds of examples could be cited. This is therefore an example of how architecture replicates in a purely symbolic way a hieroglyph which in turn was invented through a symbolic, cognitive process.

4. Conclusions

The examples we have discussed show that a strong interaction existed in Egypt between the generation of writing icons and that of tangible, architectural things. Invention in sacred architecture and invention in sacred writing were mutually interchangeable, and Pharaohs like Snefru, Khufu and Akhenaten brought it to an even higher level of sophistication, connecting with writings the whole of the sacred landscapes built for their afterlife.

The impressive complexity of the Egyptian interplay between creation, writing, and architecture can be better under-

stood in the framework of cultural memory: the preservation of collective knowledge handed down from one generation to the next, and the construction of a collective identity through a shared past (Assmann 2011). In Egypt, cultural memory embodied in cultural, built landscapes helped to transmit this identity and to reassess the divine powers – and the divine rights – of the Pharaohs.

It is an extraordinary fact that we are able to read these messages and to witness to these magnificent actualizations of ideas in architecture still today, to the point that a noteworthy statement by Le Corbusier applies perfectly to them, although pronounced some 4500 years later: architecture is the masterly, correct and magnificent play of masses brought together in light.